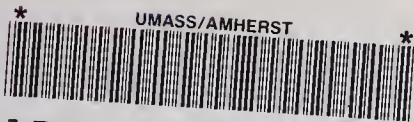


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PUBLIC POWER CORPORATION STUDY COMMISSION



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Feasibility and Benefits of a Public Power Corporation for Massachusetts February, 1975

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**REPORT OF
PUBLIC POWER CORPORATION STUDY COMMISSION**

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PUBLIC POWER CORPORATION STUDY COMMISSION

Room 717, 294 Washington Street, Boston, Massachusetts 02108 617-727-4099

Marsom B. Pratt, *Chairman*
Stephen G. Breyer
Robert W. Feragen
James J. Fiorentini

Paul W. MacAvoy
Nathan S. Paven
G. Gerald O'Donahoe
Donald E. Rose

John R. Buckley, *ex-officio*, Secretary of Administration and Finance
Lola Dickerman, *ex-officio*, Secretary of Consumer Affairs
Barbara L. Hassenfeld, *ex-officio*, Chairman, Department of Public Utilities
Paul F. Levy, *Executive Director*

March 6, 1975

The Honorable Michael S. Dukakis
Governor of the Commonwealth of Massachusetts
Executive Department—Room 360
State House
Boston, Massachusetts 02133

Dear Sir:

In response to your request we forward herewith the report of the Public Power Corporation Study Commission.

The Commission voted unanimously to release the report as submitted herewith. All members voted in favor of all aspects of the report with the exception of Mr. Rose who voted against a number of the assumptions used in the calculations of savings in financing costs.

We stand ready to respond to any questions you or your staff may have regarding the contents of this report. We trust that the report will be of value to you, the Legislature, and the people of the Commonwealth in discussing the merits of public power for Massachusetts.

Very truly yours,

/s/

Marsom B. Pratt
Chairman

INTRODUCTION AND SUMMARY

The Public Power Corporation Study Commission was established by an Executive Order dated July 10, 1974 to investigate the feasibility and benefits of establishing a public power corporation to undertake construction of new electric power plants within the Commonwealth of Massachusetts.

The Commission is composed of eight members serving voluntarily at the Governor's request and three ex-officio members, the Secretaries of Consumer Affairs and Administration and Finance and the Chairman of the Department of Public Utilities. The members of the Commission represent a wide variety of backgrounds: law, economics, finance, regulatory policy, public and private utility management, and consumer interests. The Commission is assisted by an Executive Director, Paul F. Levy, of the Massachusetts Energy Policy Office. In addition, a number of experts in areas such as system planning, tax law, and finance appeared before the Commission.

The current members of the Commission are as follows:

Marsom B. Pratt, <i>Chairman</i>	Senior Vice President of Adams, Harkness & Hill, Inc., investment bankers, a graduate engineer and a specialist in municipal financing.
Stephen G. Breyer	Professor of Law at Harvard Law School and author of the recent book, <i>Energy Regulation by the Federal Power Commission</i> . Last winter Professor Breyer served on Governor Sargent's Emergency Energy Committee.
John R. Buckley, <i>ex-officio</i>	Secretary of Administration and Finance of the Commonwealth of Massachusetts.
Lola Dickerman, <i>ex-officio</i>	Secretary of Consumer Affairs of the Commonwealth of Massachusetts.
Robert W. Feragen	General Manager of the Massachusetts Municipal Wholesale Electric Company and formerly General Manager of Northeast Public Power Association and Assistant to the General Manager of Basin Electric Power Cooperative which provides power to over 100 cooperative systems in the West.
James J. Fiorentini	Lawyer representing the Merimac Valley Consumers Organization, a major consumer group concerned with the cost of electricity.
Barbara L. Hassenfeld, <i>ex-officio</i>	Chairman of the Department of Public Utilities of the Commonwealth of Massachusetts.
Paul W. MacAvoy	Henry Luce Professor of Public Policy at the Massachusetts Institute of Technology and author of the forthcoming book, <i>The Economics of the Natural Gas Shortage 1960-1980</i> .
G. Gerald O'Donahoe	Vice President of Harbridge House, a leading consulting firm. Consultant to government and industry on the economic and social impact of energy and transportation related programs.
Nathan S. Paven	Partner in the law firm of Flamm, Mason and Paven with extensive experience in the utilities field. Served as Special Counsel to the Massachusetts Consumers Council, representing the Council before the Department of Public Utilities in electric rate hearings.
Donald E. Rose	Assistant Treasurer of the New England Electric System, parent company of New England Power and Massachusetts Electric, with extensive experience in utility financial matters.

The following individuals were of special service to the Commission in providing technical information on utility planning and financing:

Robert Bigelow, Chairman NEPOOL Planning Committee
Donald Bourcier, NEPLAN Load Analyst
Lynn Browne, Massachusetts Executive Office of Administration and Finance
Philip M. Dolan, Corporate Finance Dept., Salomon Brothers
Edward H. Ladd, Standish, Ayer & Wood, Inc.
Philip M. Law, Jr., Municipal Finance Dept., Salomon Brothers
Ralph W. Muller, Massachusetts Executive Office of Administration and Finance
James W. Perkins, Esq. Palmer & Dodge, Attorneys
David Russell, Massachusetts Department of Public Utilities
Robert M. Shepard, Partner-in-Charge, Municipal Finance Department, Kuhn, Loeb & Co.
Robert G. Taylor, R. W. Beck and Associates, Analytical and Consulting Engineers

Since July the Commission has conducted an investigation into state involvement in electric power generation. Unfortunately, the Commission was not able to explore fully all aspects of the public power issue for Massachusetts. The Commission operated without funds, had the use of only one staff member, and had to rely extensively on the expertise of its members and their associates.

It should be noted that the Commission has not addressed a number of issues, which, while of great political and social importance, are not part of its mandate under the Executive Order. For example, we have not studied the question of subsidies for the elderly, the lifeline concept of electricity pricing, or rate restructuring. We have not investigated public power corporation tax or in-lieu-of tax relationships with municipalities. This report is a study of the major questions surrounding public power and is not a complete analysis of the private-public power question. The Legislature and the people, if they do establish a public power corporation, will still have to deal with these and other electric utility issues.

The Commission has divided its task into a number of parts. First, it investigated the savings which might result from public financing and ownership of power plants. The price issue provided the impetus for the creation of the Commission, so this issue received special attention. Secondly, the Commission investigated other, equally important, issues related to public power. For example, it examined the areas of electric generating system planning and reliability, environmental issues, pricing policies, and legal issues. Finally, the Commission studied ways in which a public power corporation, if created, might be organized, including provisions for internal and external mechanisms which would help to make the corporation responsive to the public need, yet at the same time independent from political pressures. The Commission trusts that the report will be of value to the Governor, the Legislature, and the public as the public power initiative petition submitted by Congressman Harrington and other power related bills now before the Legislature are considered.

The Commission has reached the following conclusions:

- 1) A public power corporation would be able to finance generating facilities at a lower cost than is available to privately owned utilities. This is because of advantages in the method of financing available to a public power corporation due in part to relative freedom from rate regulation. The savings cannot be forecasted with accuracy at this time, because they depend on future interest rates, debt-equity ratios, deferred taxes, and various Federal energy policies. In an attempt to focus future studies, we have made a study of savings based on a range of probable values for these critical financial and policy conditions using the 1985 figures in Exhibits A and B for illustrative purposes.

A public power corporation could finance with tax-exempt bonds, taxable bonds or a combination of tax-exempt and taxable bonds. A public power corporation might elect to participate in only those facilities which could be financed with tax-exempt bonds.

The study of the Commission indicates that most likely savings in financing costs for incremental capacity due to public power corporation financing would be: (a) 32.6% for facilities financed with tax-exempt bonds; (b) 15.9% for facilities financed with taxable bonds with a range of 12.7% to 19.1% for such financing; and (c) 18.5% for facilities financed with a 15% tax-exempt and 80% taxable mix of bonds (assumes 5% financed with tax-exempt bonds issued under existing legislation) with a range of from 15.8% to 21.2% for such a mix. This conclusion does not mean that electricity consumers will experience rate savings directly related to these financing savings because electricity rates also include cost of fuel, costs of operation and other costs.

Assuming there is a pass-through of financing cost savings to the consumer, we have made an estimate of (a) savings in mills (1/10ths of 1¢) per kwh in the retail cost of power and (b) percent savings in total retail costs.

The most likely savings in mills per kwh for each kwh produced by the new generating capacity due to public power corporation financing would be: (a) 4.5 mills for facilities financed with tax-exempt bonds; (b) 2.2 mills for facilities financed with taxable bonds with a range of 1.7 mills to 2.6 mills for such financing; and (c) 2.5 mills for facilities financed with a 15% tax-exempt and 80% taxable mix of bonds with a range of 2.1 mills to 3.1 mills for such a mix.

Assuming that a public power corporation will build capacity in amounts which will result in aggregate public power corporation capacity in 1985 which will produce 50% of total kwh generated in 1985 (This result is dependent on the public power corporation purchasing plants or participating in the ownership of plants built by private utilities.) and assuming a kwh price of 60 mills in 1985, the most likely savings in electricity costs to ultimate consumers as a percentage of the total cost per kwh using the 15% tax exempt and 80% taxable mix of financing would be approximately 2.1% with a range of 1.8% to 2.6%. The savings in dollars equivalent to a 2.1% savings in 1985 would be approximately \$92 million based on an estimated \$4.4 billion which might be spent by consumers on electricity in that year.

2) While there might be differences in operating costs between public and private power corporations, the Commission has assumed that, under equally efficient management, the operating costs of public and private corporations would be similar.

3) There is nothing inherent in the concept of public power that would lead to better or worse system planning and reliability, pricing policies, or concern for the environment. The effectiveness of a state Corporation to respond to such considerations as energy conservation, environmental protection, rate making, and other public policy matters will be determined by the structure given it by the Legislature.

4) If a public corporation is created, able administrators and skilled technicians would be as attracted to it as to a private power company; therefore, there is no serious question regarding availability of qualified workers.

5) A public power corporation might have special value in times of financial stress for the private utilities and might be necessary to assure an adequate supply of electricity during such times.

6) A public power corporation should be responsive and sensitive to the views of the public, but it should have sufficient independence to make long-term decisions without being unduly influenced by short-term political considerations. Too exposed to political change, it could be hampered in its effective operation; too isolated from public opinion, it may drift from serving public needs.

Further study of the relative operating and financing costs, including the historical record of such costs, under public and private ownership might well be undertaken.

Consideration should be given to the areas in which the cooperation between public and private power in the financing, construction, and operation of plants and the distribution of power would be beneficial.

The Commission has not, in the course of its deliberations, voted on whether or not to recommend that a public power corporation be established in the Commonwealth. The purpose of this report is to examine the advantages and disadvantages of such a corporation. Individual members of the Commission have their own views regarding the advisability of creating a public power corporation and are free to let these views be known to the Legislature and the Governor.

Recent events have created many serious problems which affect fuel, operating and capital costs which place pressure on the rates paid by the Commonwealth's consumers of electric power. Creation of a public power corporation cannot solve problems such as supply and demand factors and Federal policies which increase the cost of oil or other energy sources. In addition, variations in the projected demand for electricity, due to price elasticity, conservation, and so on, will introduce an element of uncertainty in the planning of any electricity supply system. The debate on public-private power is by definition an emotional one. In other areas where the issue has arisen, extensive public relations campaigns have sometimes interfered with rational debate. We believe the question of a public power corporation deserves the reasoned attention of all voters, and an understanding of the utility industry is required to make a wise decision. We urge serious debate in the public media, and hope that as a public service, newspapers, radio and television stations will treat the issue with the seriousness it deserves.

COST OF POWER

Introduction

The Commission has made an estimate of the extent to which public ownership of electric generating facilities would affect the cost of electricity to the ultimate rate payer, has examined the various elements of cost and has attempted to place them in proper perspective.

Despite limited resources, the Commission believes that its investigation of the financing costs of a private utility and a public power corporation is the most comprehensive in terms of the variables considered ever undertaken. Adequate staff and funding would have resulted in the depth of analysis more appropriate to the importance of the question at hand.

Present Cost of Power

The cost in February, 1975, for the average residential consumption of electricity, including current fuel adjustment charges, ranged from approximately 45 to 55 mills (4.5¢ to 5.5¢) per kwh depending on the area served and the distributing company. The following analysis of possible electricity cost savings due to public power will be more meaningful if related to these costs.

Operating Costs

Although the Commission has not had the resources to conduct a thorough review of public and private utility operating costs, it has found little reason to expect that the costs of salaries, wages, and fuel under a public power corporation would be significantly different from those under private ownership. For example, it has assumed that combined management salary and benefit levels would need to be comparable to those of a private utility if the public corporation is to attract the kind of talent needed to run a complex venture. Both public and private corporations would be subject to the same market conditions in the purchase of fuel, supplies, and equipment.

Although there might be factors that would invalidate the Commission's assumption of equal operating costs, the Commission is not in a position to quantify or predict them for Massachusetts.

Financing Costs

Savings in financing costs arise due to the different methods of financing which are available to private utilities and public power corporations and the effect federal income tax provisions have on the financing methods.

Reasonably accurate estimates of the relative costs of financing for a private utility company and a public power corporation assume great importance when related to the total dollar volume of generating plant construction which may be required. The model used in the projections made by the Commission indicated possible expenditures for this purpose of approximately \$45 billion during the next thirty years.

A. Private Utility Financing

Private power companies operating in Massachusetts are financed with taxable bonds and equity (preferred and common stock) together with interest free funds from accumulated unamortized deferred income taxes and accumulated investment tax credits.

Accumulated deferred income taxes and accumulated investment tax credits arise from the "normalized" accounting methods used by the private power companies. Under the normalized method the utility is allowed to set rates which are intended to produce an allowed rate of return on net investment including a provision for federal income taxes which is more than the amount actually required to be paid to the United States Treasury. The excess of the amount of federal tax allowed over the amount actually paid is due to the difference between book depreciation and the accelerated tax depreciation and Investment Tax Credit provisions of the Internal Revenue Code. These provisions produce tax savings or credits which are recorded as expenses and which are normalized or deferred on the books of the companies.

Such tax deferrals reduce financing costs by providing interest free funds to the private utility which can be used for construction, thereby, reducing the amount of debt and equity capital which it must obtain to finance capital costs of generating facilities. The private utility is allowed an investment return on the net investment base (depreciated cost of plant less interest free moneys).

Private power companies raise a portion of needed capital through the sale of taxable bonds. Private power companies are limited in their ability to issue bonds. The greater the amount of the debt in the capital structure, the greater the risk that a short-fall in revenues will result in the inability of the private company to meet its obligations to pay interest and principal on debt when due. The limitations on the amount of debt are determined by investor attitudes and by the provisions of debt instruments (indentures) which secure the debt being issued. The indenture provisions may be based upon standards established by regulatory commissions or other public bodies for the protection of investors.

Private power companies raise the balance of their capital through the issuance of preferred and common stock. Whereas the after-tax cost of preferred stock is close to the cost of debt, the cost of common equity is more expensive since (1) the investor in common is at the end of the line and must bear the full risk of a short-fall in revenues and (2) only a portion of the earnings available for common are actually paid out in the form of dividends (the balance being reinvested in the utility).

The real pre-tax cost of equity (both preferred and common) is higher than debt since earnings available for equity (but not debt) are subject to taxation by the Federal Government. However, as indicated above, the tax actually paid to the Federal Government can be substantially less than the amount charged against income on the books, since such amounts include not only the tax to be paid but also the provisions for the deferred income taxes and investment tax credits which are normalized.

The ability of a private power company to maximize the use of lower cost debt for financing new facilities will be dependent upon the private companies ability to earn an adequate investment return.

In summary, the cost of financing a privately owned power plant is a function of:

- 1) the debt-equity ratio
- 2) the cost of debt and equity
- 3) the amount of interest free funds that are generated by tax benefits

B. Public Power Corporation Financing

Financing of new generating facilities by a public power corporation probably would be done with revenue bonds. Since the earnings of a public power corporation would not be taxable and the public power corporation would have no tax deferrals available to offset the cost of financing, the public power corporation would have to obtain outside capital for 100% of the cost of a facility.

A public power corporation would not be limited in its ability to issue debt. New facilities could be financed 100% by debt (although surplus earnings that are accumulated in future years could also be used for facility financing). However, with 100% debt financing the holder of debt bears all of the risk that a short-fall in revenues will result in the inability of a public power corporation to meet its obligations to pay interest and principal on debt when due. The right to increase rates automatically is required to eliminate the risk of regulatory lag. Such a right would permit the public power corporation to make the covenants with investors contained in typical bond indentures that the corporation will maintain rates which will produce revenues in each year sufficient to pay its costs of operation and maintenance, the debt service on bonds and reserve requirements established by the bond indenture.

The debt service on public power corporation bonds and reserve requirements of an indenture will determine the financing costs of public power corporation, which may be compared to the financing costs for private utility financing.

C. Tax Status of Public Power Corporation Bonds

A public power corporation would finance capital costs through the sale of the revenue bonds. Under certain circumstances the interest on the bonds of the corporation as an instrumentality of the Commonwealth of Massachusetts would be exempt from Federal and Commonwealth income taxes. It would be important to maximize financing with tax exempt bonds, as the exemption will result in lower interest rates to the corporation.

The Commission has examined Section 103 of the Internal Revenue Code of 1954, as amended, which deals with the tax status of interest on bonds issued by public instrumentalities. Under present regulations bonds of the public power corporation would be tax exempt if:

(1) no more than 25% of the power generated is sold under long-term contract to private purchasers such as private utilities (or used for sales within the 3% exclusion mentioned below). The balance of the capacity of the generating plant would have to be committed to municipally owned utilities, governmental entities and charitable organizations. The Power Authority of the State of New York, for instance, has just issued \$150,000,000 of bonds to finance generating facilities, the output of which will be sold primarily to governmental subdivisions or instrumentalities such as the City of New York and the Port Authority of New York and New Jersey.

(2) the public power corporation is engaged in "local furnishing" of power. "Local" has been interpreted as meaning a service area limited to two counties or equivalent political jurisdictions. There is a possibility of dividing up Massachusetts into seven two-county power districts to work within this regulation, but the feasibility or legality of this idea has not been evaluated.

A private purchaser whose minimum annual contractual payment for electricity is not more than 3 percent of the debt service on the bonds is not counted against the 25% ceiling in (1) above.

Based on the above guidelines, tax-exempt bonds could be issued to finance generating facilities to serve municipally owned utilities (responsible for approximately 13% of the total kwh sold in Massachusetts in 1973), governmental entities and charitable organizations and private utilities up to 25% of capacity plus those covered by the 3% exclusion. Furthermore, generating facilities or parts of generating facilities to serve two counties only could be financed with tax exempt bonds without consideration for type of customer. Areas might be served by a facility financed by tax-exempt bonds by taking action to make all distribution facilities in such areas municipally owned. Facilities financed with tax exempt bonds could also supply service to public customers in other states without limitations and to private utilities subject to the above limitations. Massachusetts currently requires approximately 30 billion kwh of electricity requiring approximately 7,500 megawatts (Mw) of capacity. A portion of existing capacity could be replaced by public power corporation capacity and a portion of future capacity needs could be provided by public power corporation facilities financed by tax-exempt bonds.

The Commission concludes that it is clear that a public power corporation will be able to issue some tax-exempt bonds, although it may be necessary to obtain a specific ruling regarding the tax status of its bonds under certain circumstances. Our study assumes that 5% of new generating capacity will be financed with tax-exempt bonds under existing legislation and an additional 15% of new capacity will be financed with tax-exempt bonds if a public power corporation is created.

D. Model Used in the Study of Financing Costs

The model presented herein has been formulated by the Commission to determine the possible difference in the cost of financing projects undertaken by a private utility company and a public power corporation. The assumptions used in the model were developed by the Commission within the framework suggested by Kuhn, Loeb & Co. Whereas the Commission does not claim that the model is perfectly accurate or representative, it is willing to present it as a first, rough cut at the problem with the hope that, through informed criticism, the model can be modified, improved and made more realistic. The assumptions used in the model are as follows:

1) Current generation capacity in Massachusetts is 7500 megawatts. Over the next thirty years, new capacity each year will equal 8% of the prior year's capacity, 6% for increased demand and 2% to replace old facilities.

2) Of the new capacity built by the public corporation, 20% would be financed by tax-exempt bonds, and the balance would be financed by taxable bonds. This assumption is based on our best estimate of tax exempt financing available to the public corporation under the present Internal Revenue Service regulations. We assume that 15% of the output of the plant would be sold to municipal system customers, government entities and charitable organizations and that an additional 5% (25% of 20%) could also be financed with tax-exempt bonds. Under certain circumstances more than 20% of capacity could be financed with tax-exempt bonds.

The study assumes (a) upon creation of a new public power corporation, 5% of new generating capacity will be financed with tax-exempt bonds under existing legislation and therefore should not be taken into consideration in calculating cost savings which might accrue from new legislation and (b) the 95% balance could be financed as follows: (1) by the private utilities using 95% traditional financing methods; or (2) by the public power corporation using a mix of 80% taxable bonds and 15% tax-exempt. Our savings calculations compare (1) and (2).

3) Tax-exempt public corporation bonds would bear interest at 7%. Taxable public corporation bonds would bear interest at 9½%. The public corporation bonds would be amortized on a 30 year level debt service basis. The public corporation's revenue requirements are established to produce net revenues equal to 1.25 x debt service. Surplus revenues are used to prepay debt, last maturity of first incurred debt first.

4) The over-all return on capital of the private utility is 12%. This percentage is based on the return on debt and equity, the debt-equity ratio, and the proportion of capital furnished through deferred taxes. The interest on debt is assumed to be 9%. 25% of the equity would be preferred stock returning 9%, and 75% of the equity would be common stock returning 12.5%. The debt-equity ratio is assumed to be 62-38, and approximately 15% of the capital used for financing is provided by deferred taxes. The rate base equals the aggregate new construction depreciated on a 28-year straight line basis.

5) The debt service reserve fund for the public corporation has been disregarded. The reserve fund has a minimal effect on the figures. Even allowing for (i) a 2% shortfall on interest earned on investment of the reserve fund when relative to the interest paid, and (ii) for surplus attributable to debt allocable to the reserve fund, the public corporation's revenues on average would only be about 1% greater than the amount shown.

6) The number of mills per kilowatthour is calculated on the basis of one kilowatt of capacity generating 5000 kwh per year, equivalent to generation at 57% of capacity, a realistic assumption when dealing with load capacity. A mix of fossil fuel, pumped storage and nuclear capacity in 1974 would cost \$325 per kilowatt. This amount is inflated at an annual assumed rate of 6%.

E. Estimates of Savings in Financial Costs Based on Model

The operation of the model produces a comparison of private and public utility financing costs given the assumptions of growth and other factors listed above. The example is divided into two parts. In Exhibit A Column 6, we see the difference in revenue required to provide for public and private financing of 15% of additional plant capacity. This 15% would be financed by the public power corporation with tax-exempt bonds at 7% and by the private utility company with capital costing 12%. Column 7 shows the percent savings which might result from these forms of financing for this portion of new capacity. Exhibit B gives a similar comparison. Here, however, the public corporation is financing the remaining 80% of additional capacity with taxable bonds at 9½%. Column 6 shows the difference in revenue required resulting from this kind of financing, and Column 7 shows the percent savings.

Percentage savings in the cost of financing are extremely dependent on the assumptions used in the model. They should not be taken as absolute. Two factors, for example, which are very important in determining the final percentages are the return on private capital and the return on public power corporation taxable bonds. In Exhibits A and B, these were assumed to be 12% and 9½%, respectively. Some Commission members believe that the 2½% spread between 12% and 9½% is too small and some believe it is too large. We, therefore, present savings based on the most likely spread of 2½% and a range of savings based on spreads of 2% and 3%.

The study of the Commission indicates that most likely savings in financing costs for incremental capacity due to public power financing would be: (a) 32.6% for facilities financed with tax-exempt bonds; (b) 15.9% for facilities financed with taxable bonds with a range of 12.7% to 19.1% for such financing; and (c) 18.5% (see Note) for facilities financed with a 15% tax-exempt and 80% taxable mix of bonds with a range of from 15.8% to 21.2% for such a mix. This conclusion does not mean that electricity consumers will experience rate savings directly related to these financing savings because electricity rates also include cost of fuel, costs of operation and other costs.

Assuming there is a pass-through of financing cost savings to the consumer, we have made an estimate of (a) mill savings per kwh in the retail cost of power and (b) percent savings in total retail costs.

The most likely savings in mills per kwh for each kwh produced by the new generating capacity due to public power corporation financing would be: (a) 4.5 mills for facilities financed with tax-exempt bonds; (b) 2.2 mills for facilities financed with taxable bonds with a range of 1.7 mills to 2.6 mills for such financing; and (c) 2.5 mills for facilities financed with a 15% tax-exempt and 80% taxable mix of bonds with a range of 2.1 mills to 3.1 mills for such a mix.

Assuming that a public power corporation will build capacity in amounts which will result in aggregate public power corporation capacity in 1985 which will produce 50% of total kwh generated in 1985. (This result is dependent on the public power corporation purchasing plants or participating in the ownership of plants built by private utilities.) and assuming a kwh price of 60 mills in 1985, the most likely savings in electricity costs to ultimate consumers as a percentage of the total cost using the 15% tax-exempt and 80% taxable mix of financing would be approximately 2.1% with a range of 1.8% to 2.6%. The savings in dollars equivalent to a 2.1% savings in 1985 would be approximately \$92 million based on an estimated \$4.4 billion which might be spent by consumers on electricity in that year.

It is expected that there will be pass-through to the consumer of these reductions in the cost of financing.

Savings projected for financing costs are meant as a rough guide, a range of possible savings which, as mentioned above, are very sensitive to the assumptions used. We hope that the range of values of the financial variables we have used in this report will help to focus future studies.

NOTE: For any one year, the total percentage savings of public corporation financing based on a mix of 15% tax-exempt and 80% taxable bonds can be calculated by taking a weighted average of the two column 7 figures. For example, in 1985, it is estimated that 32.6% would be saved for 15% of net additional plant, and 15.9% would be saved for 80% percent of net additional plant. The weighted average of these two figures, $[(15\%) \times (32.6\%) + (80\%) \times (15.9\%)] \div 95\%$, is 18.5%. Similar calculations could be performed for each year although the percentage does not vary substantially from year to year.

NON-FINANCIAL CONSIDERATIONS

Independence vs. Responsiveness

A key requirement for any public power corporation for the Commonwealth is that such a corporation be responsive and sensitive to the views of the public and yet have sufficient independence to make long-term decisions without being unduly influenced by short-term political considerations. The creation of electrical generating capacity requires long-range planning and commitments which have immediate, short-term implications for the public. There inevitably will be conflicts between short-run interests and long-term planning needs. These conflicts could result in political pressures on the corporation to modify its longer range goals to satisfy the short term objectives of special interest groups. A balance between sensitivity and independence will be needed if a public power corporation is created. The Commission has investigated means of establishing balance and discusses below ways in which such balance can be approached, if not guaranteed.

A. Applicable Laws

A public power corporation should be required to submit insofar as is applicable to the same laws faced by privately and municipally owned electric utilities. It should, for example, have to fulfill all of the requirements of local and state environmental regulations and laws and should be subject to the authority of the Energy Facilities Siting Council. The public should be able to impose its wishes on the public power corporation, but only through the legislative process. The directors of a public power corporation would have discretion within the law to adopt policies best suited to the organization and plans of the corporation. While the public always would have the option of affecting the operations of the power corporation, this could not be done capriciously, but only through the process of amending or enacting laws, thereby establishing a balance between the public's influence and the corporation's independence.

The corporation should be free from rate regulation by the Department of Public Utilities, but should be required to conduct public hearings under the provisions of the Administrative Practices Act prior to changing its rates.

B. Board of Directors

The internal structure of the public power corporation would have an important impact on its independence and sensitivity. The Commission recommends that:

1. There should be a board of directors which would serve as the main policy-making body of the public power corporation. Serving at its pleasure should be an executive director who would be responsible for day-to-day corporation decisions and would answer to the board for his actions.
2. The board of directors should be appointed by the Governor. The terms of the members should not be coterminous and should be longer than the Governor's term of office to maintain independence and a sense of continuity in the organization.
3. The Governor, in appointing the members of the board, should give special consideration to choosing people from a) different geographic areas of the state and b) diverse interest groups. The generation of electricity is an issue of great importance to the whole Commonwealth, therefore, a geographically representative board would be desirable. Similarly, various interest groups should be represented on the board. Some likely categories include: labor, consumer, environmental, commercial, industrial, financial, and electric utility. The Governor and the Legislature should make provisions for insuring this kind of representation.
4. The board should have from 5 and 9 members, a number small enough to encourage active participation.

5. The board members should be adequately compensated for their services, as they will be making decisions comparable to those required of top private corporate executives and will be expected to plan expensive and vital generating facilities for the state.

6. The board of directors should be non-partisan.

7. The board of directors should be required to submit an annual report to the Governor and Legislature summarizing the year's activities, finances, and plans for the future. The corporation's records should be available for public scrutiny, and the corporation meetings should be subject to the open meeting laws, when applicable. The corporation should, when possible, conduct public hearings on its activities.

C. Personnel

The public power corporation should be allowed maximum flexibility in the area of selecting personnel.

The Commission believes that a public power corporation should not be required to satisfy Civil Service procedures for its employees. Employees should be hired by the Executive Director and all management level appointments should be subject to the approval of the Directors. The corporation should be allowed discretion in drawing up job guidelines and qualifications for its higher level employees which will enable it to get the professional and technical expertise needed for a complex undertaking.

Preference in hiring should be extended to employees of private utilities whose jobs may be displaced by the creation of a corporation. The corporation should be required to bargain collectively with its employees subject to the requirements of G.L.C. 150A. Protection similar to those afforded employees of other public instrumentalities should be incorporated.

The Commission believes that, if a public power corporation is created, able administrators and skilled technicians would be as attracted to it as to a private company, especially if the aforementioned procedures are followed.

System Planning

The Commission has studied whether the Commonwealth would have the capacity for better system planning if a public power corporation existed.

This question must be examined within the context of the New England Power Pool (NEPOOL). NEPOOL already acts, to a large extent, to centralize the planning of electric generating facilities in New England. The Power Planning section of NEPOOL helps to locate plants at sites that would best serve the region as a whole. The Corporation would most certainly join NEPOOL, for NEPOOL controls the dispatching of nearly 100 percent of the region's electricity. Such participation could well mean that the corporation would share in the costs of building plants outside the Commonwealth to provide capacity to serve Massachusetts consumers. If the corporation were excluded from interstate participation, regional planning and coordination would suffer.

Massachusetts has a central agency, the Energy Facilities Siting Council, to monitor and coordinate the siting and construction schedule of electric generating facilities. The Council must approve all demand projections and construction programs of the electric utilities.

The Commission concludes that, under normal planning conditions and given these area planning bodies, there is no inherent advantage or disadvantage in a public power corporation over private utilities in the area of system planning.

Insuring An Adequate Supply of Electricity

A public corporation might have the potential to perform long-range planning and to construct generation facilities without being influenced by a potentially unstable financial base or unfavorable capital markets. In addition, a public corporation would, within the limits of the Administrative Practices

Act, have rate covenants included in its bond indenture which would permit the corporation to change its rates as needed so that it could meet rising costs without having to submit to time consuming regulatory procedures.

These two factors: (1) relative freedom from unfavorable capital markets and (2) freedom from regulatory constraint on rates, lead to the conclusion that while overall system planning might not be affected by the creation of a public corporation, system reliability might be. If there is a danger that, without a public power corporation, private utilities might be unable to obtain the capital necessary to provide for a secure and adequate energy supply, there may be great value in having a public power corporation available. While the Commission realizes that these advantages might be offset by the loss of incentive to control costs, it concludes that a public power corporation might have special value in times of financial stress and might be necessary to ensure an adequate supply of electricity.

Environmental Planning

The Commission has studied the question of whether there would be the capability for better environmental planning or more concern for the environment if a public power corporation existed. In looking at this issue, the Commission has assumed that a public corporation would be subject to the same local and state environmental regulations and laws as the private utilities. It finds no reason to believe that planning would be carried out in a different fashion by a public power corporation simply because it is a public corporation. The internal organization and personnel of the public corporation will be the determining factors in this area, as is the case with private companies.

EXHIBIT A

Comparison of Required Revenues for Tax-Exempt Public Power Corporation Financing and Private Utility Financing Covering 15% of Massachusetts Net Additional Generating Plant (000's omitted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Year	15% of Mass. Net Additional Plant	Return on Private capital 12% x (1) (*) See Note	Private Deprecia- tion	Total Private Required Revenues (2) + (3)	Total Public Corporation Required Revenues	Difference In Required Revenues (4)-(5)	% Savings (6) ÷ (4)	15% of total net additional Mw capacity	Total Mwh Generated (*)	Savings in Mills per KWH
1975	\$ 31,005	\$	\$	\$	\$	\$	%	90		
1976	64,735	3,720	1,108	4,828	3,123	1,705	35.3	184	450	3.8
1977	101,526	7,768	2,352	10,120	6,632	3,488	35.0	282	920	3.8
1978	141,758	12,183	3,750	15,933	10,521	5,412	34.0	385	1,410	3.8
1979	185,855	17,011	5,320	22,331	14,835	7,496	33.3	492	1,925	3.9
1980	234,295	22,302	7,085	29,387	19,629	9,758	33.2	605	2,460	4.0
1981	287,614	28,116	9,068	37,184	24,962	12,222	32.9	723	3,025	4.0
1982	346,418	34,514	11,296	45,810	30,904	14,906	32.5	847	3,615	4.1
1983	411,382	41,570	13,800	55,370	37,528	17,842	32.4	977	4,235	4.2
1984	483,267	49,366	16,613	65,979	44,921	21,058	31.9	1,114	4,885	4.3
1985	562,931	57,992	19,774	77,766	52,425	25,341	32.6	1,257	5,570	4.5
1990	1,116,042	117,655	42,496	160,151	108,890	51,261	32.0	2,092	9,535	5.4
1995	2,071,156	220,252	83,190	303,442	207,588	95,854	31.6	3,174	14,655	6.5
2000	3,746,194	399,736	156,066	555,802	381,458	174,344	31.3	4,576	21,320	8.2
2005	6,713,963	715,934	283,866	999,800	687,250	312,550	31.1	6,419	30,045	10.4

(*) Based (*) Based on Mw in place at beginning of prior year.

Note: 12% rate is calculated as follows:

1. 15% of capital provided by tax deferrals @ 0%
2. Remaining capital 62% debt @ 9% and 38% equity
3. Equity 25% preferred stock @ 9% and 75% common stock @ 12.5% after federal taxes @ 48%

62% x 85% @ 9%	4.74%
38% x 85% @ 22.4% (25% @ 9% and 75% @ 12.5% plus taxes @ 48%)	7.24
15% @ 0%	0
	<hr/>
	11.98%
	(12%)

**Comparison of Required Revenues for Taxable
Public Power Corporation Financing and Private Utility Financing
Covering 80% of Massachusetts Net Additional Generating Plant
(000's omitted)**

Year	(1) 80% of Mass. Net additional Plant	(2) Return on Private capital 12% x (1) (*)	(3) Private Deprecia- tion	(4) Private Revenues (2) + (3)	(5) Public Corporation in Revenues (@9½%)	(6) Difference in Revenues Required (4) - (5)	(7) % Savings (6) ÷ (4)	(8) 80% of total net additional Mw capacity	(9) Total Mwh Generated (*)	(10) Savings in Mills per Kwh
1975	\$165,359	\$	\$	\$	\$	\$		479		
1976	345,252	19,843	5,906	25,749	21,017	4,732	18.4	980	2,395	2.0
1977	541,473	41,430	12,541	53,971	44,632	9,339	17.3	1,504	4,900	1.9
1978	756,042	64,977	19,997	84,974	70,666	14,308	16.8	2,052	7,520	1.9
1979	991,227	90,725	28,375	119,100	99,421	19,679	16.5	2,626	10,260	1.9
1980	1,249,574	118,947	37,787	156,734	131,241	25,493	16.3	3,228	13,130	1.9
1981	1,533,946	149,949	48,364	198,313	166,518	31,795	16.0	3,858	16,140	2.0
1982	1,847,562	184,074	60,247	244,321	205,692	38,629	15.8	4,519	19,290	2.0
1983	2,194,035	221,707	73,599	295,306	249,256	46,050	15.6	5,213	22,595	2.0
1984	2,577,426	263,284	88,602	351,886	297,761	54,125	15.4	5,941	26,065	2.1
1985	3,002,299	309,291	105,459	414,750	348,708	66,042	15.9	6,705	29,705	2.2
1990	5,952,229	627,496	226,648	854,144	722,113	132,031	15.5	11,155	50,864	2.6
1995	11,046,168	1,174,580	443,679	1,618,359	1,371,563	246,796	15.2	16,909	78,172	3.2
2000	19,979,699	2,131,931	832,350	2,964,281	2,507,730	456,551	15.4	24,406	113,704	4.0
2005	35,807,803	3,824,258	1,515,858	5,340,116	4,554,595	785,521	14.7	34,237	160,248	4.9

(*) Based on Mw in place at beginning of prior year.

COMMONWEALTH OF MASSACHUSETTS

By His Excellency

FRANCIS W. SARGENT

Governor

EXECUTIVE ORDER NO. 109

Public Power Corporation Study Commission

WHEREAS, The increasing costs of producing electric power are placing substantial burdens upon the consumers and economy of the Commonwealth;

WHEREAS, The construction of new electric power plants by a public power corporation may substantially reduce such burdens, thereby benefitting the consumers and economy of the Commonwealth;

WHEREAS, A comprehensive study of the feasibility and benefits of such a corporation is necessary;

NOW, THEREFORE, I, Francis W. Sargent, by virtue of the authority vested in me as Supreme Executive Magistrate, do hereby order as follows:

1. There shall be a Public Power Corporation Study Commission, hereinafter called the Commission, comprised of the Secretaries of Consumer Affairs and Administration and Finance, the Chairman of the Public Utilities Commission, and 8 other members, appointed by the Governor, who shall be other public officials or persons knowledgeable about finance or electric power production or consumption. The Governor may from time to time designate one of the members to serve as Chairman. Members of the Commission shall serve without compensation.

2. The Commission shall conduct a study of the feasibility and benefits of establishing a public power corporation to undertake construction of new electric power plants within the Commonwealth, giving particular attention to:

- (a) leasing of such plants to private power producers,
- (b) distribution of power produced by such plants by private power producers,
- (c) the corporate structure of such a corporation, and
- (d) methods of financing such construction.

Given at the Executive Chamber in Boston this tenth day of July in the year one thousand nine hundred and seventy-four and the year of the independence of the United States of America, the one hundred and ninety-eighth.

FRANCIS W. SARGENT
Governor

Commonwealth of Massachusetts

JOHN F.X. DAVOREN
Secretary of the Commonwealth

GOD SAVE THE COMMONWEALTH OF MASSACHUSETTS

Comments and a Recommendation of Commission Member Rose

I believe that the approach used by the Commission in reaching its conclusions is the best attempt that I have ever seen to relate and measure the variety of variables having a bearing on financing costs of private and public corporations. I agree with the statements included in the report that the Commission does not claim that the model used in the study of financing costs is perfectly accurate or representative, and that it is a first rough cut at the problem with the hope that, through informed criticism, the model can be modified, improved and made more realistic.

If those statements were included in red bold letters on the cover of the report, a big part of my problem would disappear. But we have already seen how signatures for an initiative petition can be collected on the strength of a presentation made to the Commission which was later labeled by some members as "inoperative". The Commission also came very close to releasing a report which very substantially overestimated the dollar savings due to the lack of time for review of preliminary results. Even at the reduced amounts contained in the final report I am convinced that the estimated savings are still far too high. The problem here is that the reported results will be regarded as "the number" which the public has been anticipating the Commission to report.

It is my opinion that the Commission should not have abandoned its efforts which extended over six months to compare the comparative financing costs of a single large investment in a generating plant in favor of the new method first presented to the Commission on February 10, 1975. I believe that the time which the Commission had available to evaluate this new method, and the complex interactions of the dependent variables, was inadequate.

There are a number of critical assumptions which can have a substantial impact on the results produced by the new approach. Due to the fact that the Commission had only limited staff, it was left to the members, all of whom have busy work schedules, to review the assumptions and then analyze the results. Due to the pressure upon the Commission to release its report, time was not available to permit a careful analysis of the assumptions used or the results reached which a report of this importance so obviously requires. Among the assumptions that must be worked upon further for needed documentation or revision are:

1. That the amounts of tax deferrals available for investment would be only 15 percent when the related effective tax rate would be a full 48 percent.
2. That the substantial impact of the annual amortization of investment tax credits can be disregarded, when it would reduce the required return on private capital by 5.3% over the life of a nuclear generating plant depreciated over 28 years.
3. That the return on private capital would be an equal annual percentage of depreciated plant, when the debt service for a public corporation developed by a complex computer program shows no such relationship.
4. That the yield spread between taxable revenue bonds and tax-exempt revenue bonds would be only 26 percent when market evidence appears to indicate a higher spread is likely.
5. That the public corporation would earn only 1.25 x debt service when the Power Authority of the State of New York reported a 2.59 x coverage of debt service in 1974 compared with an indenture requirement of 1.40 x.
6. That 2 percent of the prior years capacity will be replaced each year when this appears to retire generating facilities within a period of 25 years.
7. That generating facilities with estimated lives ranging from 25 years to 60 years would be depreciated over a period of 28 years.
8. That the same generating facilities would all be financed with public corporation bonds calling for 30-year amortization on a level debt service basis, which, in conjunction with the 1.25 x debt service, would be retired within 24 years.

9. That the impact on revenue requirements for the public corporation of the debt service reserve fund should be disregarded.
10. That the private utilities would be allowed to include the full amount of the current years depreciation expense in rate base.
11. That private utilities would regularly earn their required return on capital.
12. That private utilities would not be able to utilize a higher percentage of debt in their capital structures, if they could regularly earn their required return on capital.

Had there been more time we could have come to grips with these questions. We could also have reviewed the question raised by an outside expert at our last meeting concerning the possible adverse impact of a public corporation on the financing of private utilities in Massachusetts. However, for all the problems that I have with the results shown in the report, it is an important document that should help to focus discussion on the real merits of the issue of private versus public power.

I have prepared the attached exhibits showing the results which our earlier approach would have produced on the basis of the public corporation issuing taxable revenue bonds. The computer print outs noted on the exhibits are not reproduced in this report, but they are available to anyone upon request. These exhibits raise some interesting questions, when they are compared to the results shown in the report. In my opinion they suggest that at least part of the savings shown in the report from financing of the public corporation arise from deferring principal payments on revenue bonds which future generations will have to pay.

I recommend that further studies on this important issue be undertaken.

COST COMPARISON PER \$1 BILLION OF PLANT INVESTMENT
AVERAGE PLANT INVESTMENT \$500,000,000

NUCLEAR GENERATION

Nuclear Facilities—28 Year Life

Public Corporation—Issuing Taxable Revenue Bonds

1. Level Debt Service @ 9.5% over 30 years.....	.1016805845%
Average Annual Amount (30 years).....	<u>\$101,680,584</u>
11. 1.25 X Level Debt Service @ 9.5% (Method used in Report)	
Average Annual Amount (24 years) (1)	<u>\$96,921,519</u>

Private Utility—28 Year Book Life—16 Year Tax Life

	<u>(A)</u>	<u>(B)</u>
Gross Investment	\$1,000,000,000	\$1,000,000,000
Average Depreciation Reserve	500,000,000	500,000,000
Average Depreciation Reserve	500,000,000	500,000,000
Average Inv. Tax Credit Balances.....	20,000,000	20,000,000
Average Def. FIT Balances (1).....	133,517,721	115,877,707
Average Investment to be financed	<u>\$346,482,279</u>	<u>\$364,122,293</u>
First Mortgage Bonds—55% (2)	\$190,565,253	\$200,267,261
Equity (Common & Preferred) 45%.....	<u>155,917,026</u>	<u>163,855,032</u>
Average Financing	<u>\$346,482,279</u>	<u>\$364,122,293</u>
Average Financing Costs		
Depreciation (28 year life)	\$35,714,286	\$35,714,286
Federal income tax @ 48% (3).....	15,412,415	16,264,224
Amortization of 4% Investment Credit	(1,428,571)	(1,428,571)
Interest @ 9% (4)	17,150,873	18,024,053
Return on equity @ 11.625% (5).....	18,125,354	19,048,147
Average Annual Amount (28 years).....	<u>\$84,974,357</u>	<u>\$87,622,139</u>
% of Average Plant Investment.....	<u>16.99%</u>	<u>17.52%</u>

(A) Assuming tax depreciation is spread over tax life.

(B) Assuming tax depreciation is spread over book life.

(1) From computer print outs.

(2) Equal to 38% and 40% of average plant investment compared to 60% maximum allowable under Securities and Exchange Commission 1956 standards.

(3) Total financing costs minus book depreciation (assuming full tax normalization) and interest times a 48% tax rate.

(4) Pre-tax interest coverage is 2.87 times as compared to minimum of 2 times coverage under Securities and Exchange Commission 1956 standards.

(5) Weighted return of 9% on preferred and 12.5% (earned) on common.

COST COMPARISON PER \$1 BILLION OF PLANT INVESTMENT
AVERAGE PLANT INVESTMENT \$500,000,000

FOSSIL GENERATION

Fossil Plant—28 Year Life (actually 25 to 30 years)

Public Corporation—Issuing Taxable Revenue Bonds

I. Level Debt Service @ 9.5% over 30 years.....	.1016805845%
Average Annual Amount (30 years)	<u>\$101,680,584</u>
II. 1.25 X Level Debt Service @ 9.5% (Method used in Report)	
Average Annual Amount (24 years) (1)	<u>\$ 96,921,519</u>

Private Utility—28 Year Book Life—22.5 Year Tax Life

	<u>(A)</u>	<u>(B)</u>
Gross Investment	\$1,000,000,000	\$1,000,000,000
Average Depreciation Reserve	500,000,000	500,000,000
Average Inv. Tax Credit Balances.....	20,000,000	20,000,000
Average Def. FIT Balances (1).....	88,002,614	75,107,058
Average Investment to be financed	<u>\$ 391,997,386</u>	<u>\$ 404,892,942</u>
First Mortgage Bonds—55% (2)	\$215,598,562	\$ 222,691,118
Equity (Common & Preferred) 45%.....	176,398,824	182,201,824
Average Financing	<u>\$ 391,997,386</u>	<u>\$ 404,892,942</u>
Average Financing Costs		
Depreciation (28 year life)	\$ 35,714,286	\$ 35,714,286
Federal income tax @ 48% (3).....	17,610,270	18,232,976
Amortization of 4% Investment Credit	(1,428,571)	(1,428,571)
Interest @ 9% (4)	19,403,871	20,042,201
Return on Equity @ 11.625% (5).....	20,506,363	21,180,962
Average Annual Amount (28 years).....	<u>\$ 91,806,219</u>	<u>\$ 93,741,854</u>
% of Average Plant Investment.....	<u>18.36%</u>	<u>18.75%</u>

(A) Assuming tax depreciation is spread over tax life.

(B) Assuming tax depreciation is spread over book life.

(1) From computer print outs.

(2) Equal to 43% and 45% of average plant investment compared to 60% maximum allowable under Securities and Exchange Commission 1956 standards.

(3) Total financing costs minus book depreciation (assuming full tax normalization) and interest times a 48% tax rate.

(4) Pre-tax interest coverage is 2.89 times as compared to minimum of 2 times coverage under Securities and Exchange Commission 1956 standards.

(5) Weighted return of 9% on preferred and 12.5% (earned) on common.

COST COMPARISON PER \$1 BILLION OF PLANT INVESTMENT
AVERAGE PLANT INVESTMENT \$500,000,000

PUMPED STORAGE GENERATION

Pumped Hydro Facilities—60 Year Life

Public Corporation—Issuing Taxable Revenue Bonds

I. Level Debt Service @ 9.5% over 30 years.....	.1016805845%
Average Annual Amount (30 years).....	<u>\$101,680,584</u>
II. 1.25 X Level Debt Service @ 9.5% (Method used in Report)	
Average Annual Amount (24 years) (1).....	<u>\$ 96,921,519</u>

Private Utility—60 Year Book Life—40 Year Tax Life

	<u>(A)</u>	<u>(B)</u>
Gross Investment	\$1,000,000,000	\$1,000,000,000
Average Depreciation Reserve	500,000,000	500,000,000
Average Investment Tax Credit Balances	20,000,000	20,000,000
Average Def. FIT Balances (1).....	111,961,896	94,023,939
Average Investment to be financed	<u>\$ 368,038,104</u>	<u>\$ 385,976,061</u>
First Mortgage Bonds—55% (2).....	\$ 202,420,957	\$ 212,286,834
Equity (Common & Preferred) 45%.....	165,617,147	173,689,227
Average Financing	<u>\$ 368,038,104</u>	<u>\$ 385,976,061</u>
Average Financing Costs		
Depreciation (60 year life)	\$ 16,666,667	\$ 16,666,667
Federal income tax @ 48% (3).....	17,156,609	18,022,806
Amortization of 4% Investment Credit	(666,667)	(666,667)
Interest @ 9% (4).....	18,217,886	19,105,815
Return on equity @ 11.625% (5).....	19,252,993	20,191,373
Average Annual Amount (60 years).....	<u>\$ 70,627,488</u>	<u>\$ 73,319,994</u>
% of Average Plant Investment	<u>14.13%</u>	<u>14.66%</u>

(A) Assuming tax depreciation is spread over tax life.

(B) Assuming tax depreciation is spread over book life.

(1) From computer print outs (See Appendix C-1, C-2 and C-3).

(2) Equal to 41% and 43% of average plant investment compared to 60% maximum allowable under Securities and Exchange Commission 1956 standards.

(3) Total financing costs minus book depreciation (assuming full tax normalization) and interest times a 48% tax rate.

(4) Pre-tax interest coverage is 2.96 times as compared to minimum of 2 times coverage under Securities and Exchange Commission 1956 standards.

(5) Weighted return of 9% on preferred and 12.5% (earned) on common.